JOURNAL OF RESEARCH IN SCIENCE TEACHING Vol. 8, PP. 401–402 (1971)

AUTHOR INDEX

Anderson, O. Roger: Editorial: Research in the "Open Classroom," 97
Anderson, Ronald D. and Thompson, Albert R.: Mutually Aided Learning: An Evaluation, 297
Atwood, Ronald K.: Development of a Cognitive Preference Examination Utilizing General Science and Social Science Content, 273
Babikian, Yeghia: An Empirical Investigation to Determine the Relative Effectiveness of Discovery, Laboratory, and Expository Methods of Teaching Science Concepts, 201
Beard, Jean: The Development of Group Achievement Tests for Two Basic Processes of AAAS Science—A Process Approach, 179
Benson, Bernard W. and Young, Linda L.: The Development and Implementation of an Instrument to Assess Cognitive Performance in High School Biology, 211
Brown, Eddie J.: *see* McMillan, Robert D.
Bruce, Larry R.: A Study of the Relationship between the SCIS Teachers' Attitude Toward the Teacher-Student Relationship and Question Types, 157
Campbell, James Reed: Cognitive and Affective Process Development and Its Relation to a Teacher's Interaction Ratio, 317
Capie, William and Jones, Howard L.: An Assessment of Hierarchy Validation Techniques, 137
Cohen, Ronald D.: Evaluation of Student Laboratory Reports under a Schedule of Partial Reinforcement, 185
Cox, David L.: *see* Johnson, Paul E.
Culp, G. H. and Lagowski, J. J.: Studies Involving the Application of Computer Techniques to Undergraduate Organic Chemistry Instruction, 357
Curran, Thomas E.: *see* Johnson, Paul E.
Davidoff, Stephen H., Diamond, James J., and Fishman, Roger J.: Effects of Learner Characteristics on Pupil Performance in a Computer-Assisted Instruction (CAI) Biology Program, 379
Diamond, James J.: *see* Davidoff, Stephen H.
Dietz, Maureen A.: *see* George, Kenneth D.
Doran, Rodney L. and Pella, Milton O.: Development of Motion Picture Test Items Related to Elementary School Science Concepts, 83
Druger, Marvin: *see* Hoffman, Frederic E.
— *see* Sherrill, David
Feldhusen, John F.: *see* Szabo, Michael
Fishman, Roger J.: *see* Davidoff, Stephen H.
Fulton, Harry F.: An Analysis of Student Outcomes Utilizing Two Approaches to Teaching BSCS Biology, 21
Gardner, Marjorie: Reappraising Science Education, 289
George, Kenneth D. and Dietz, Maureen A.: How Do Children Classify Objects?, 277
— and —: Author's Reply, 293
Glass, Lynn W.: Assessment of Affective Outcomes of Instruction with High School Sophomore Biology Students and Teachers, 41
Glassman, F.: *see* Tamir, P.
Good, Ronald G.: A Study of the Effects of a "Student-Structured" Laboratory Approach to Elementary Science Education Methods Courses, 255
Harke, Douglas J.: Hierarchical Analysis of the Randomized Multiple Choice Format, 29
Herron, J. Dudley: The Effect of Behavioral Objectives on Student Achievement in College Chemistry, 385
Hoch, Loren L.: Attitude Change as a Result of Sex Education, 363
Hoffman, Frederic E. and Druger, Marvin: Relative Effectiveness of Two Methods of Audio-Tutorial Instruction in Biology, 149
Holcomb, Charles M.: The Effect of Degrees of Direction in the Qualitative Analysis Laboratory on Retention of Learning, 165
Hughes, Earl F.: Role Playing as a Technique for Developing a Scientific Attitude in Elementary Teacher Trainees, 113
Hurd, Paul deHart: Research in Science Education, 243
James, Helen H.: Effects of Supervisory Methods upon Development of a Teaching Strategy by Student Teachers, 335
—: Attitude and Attitude Change; Its Influence upon Teaching Behavior, 351
Johnson, Paul E., Curran, Thomas E., and Cox, David L.: A Model for Knowledge of Concepts in Science, 91
Jones, Howard L.: *see* Capie, William
Kass, Heidi: Structure in Perceived Relations among Physics Concepts, 339
Kline, Arlyn A.: A Study of the Relationship between Self-Directed and Teacher-Directed Eighth Grade Students Involved in an Open-

Ended Supplementary ESCP Laboratory Block, 263
Koelsche, Charles L. and Newberry, S. Lloyd: A Study of the Relationship between Certain Variables and the Science Interest of Children, 237
Koran, Jr., John J.: A Study of the Effects of Written and Film-Mediated Models on the Acquisition of a Science Teaching Skill by Preservice Elementary Teachers, 45
Lagowski, J. J.: *see* Culp, G. H.
Mackay, Lindsay D.: Development of Understanding about the Nature of Science, 57
McMillan, Robert D. and Brown, Eddie J.: Audio Tapes as an Instructional Device in College Mathematics, 369
Moon, Thomas C.: A Study of Verbal Behavior Patterns in Primary Grade Classrooms During Science Activities, 171
Newberry, S. Lloyd: *see* Koelsche, Charles L.
Novak, Joseph D.: *see* Ring, Donald G.
Okey, James R.: Research on Instruction, 285
Pella, Milton O.: *see* Doran, Rodney L.
Penick, John E.: Commentary on: "An Experimental Comparison of Urban Children with Suburban Children on Eight Tasks of Basic Skills," by Kenneth D. George and Maureen A. Dietz, 291
Phillips, Darrell G.: The Development of the Concept of Displacement Volume: A Hierarchical Model and Its Partial Testing Under Two Methods of Presentation, 9
Pierce, Harmon B.: The Role of Science Division Chairmen in Regionally Accredited Two-Year Colleges: A National Survey, 251
Raven, Ronald: *see* Siegel, Betsy Davidson
Read, Floyd M.: The Value of a Study of Wave Motion on the Learning of Certain Principles of Physical Optics, 393
Riban, David M.: On the Ability to Infer Deficiency in Mathematics from Performance in Physics Using Hierarchies, 67
Ring, Donald G. and Novak, Joseph D.: The Effects of Cognitive Structure Variables on Achievement in College Chemistry, 325
Schuck, Robert F.: The Influence of Set Induction upon Pupil Perception of Effective Teaching, Achievement, and Retention in Units on Respiration and Circulation in the BSCS Curricula, 51
Sherrill, David and Druger, Marvin: Relationships among Student Variables in an Audio-Tutorial Biology Course, 191
Siegel, Betsy Davidson and Raven, Ronald: The Effects of Manipulation on the Acquisition of the Compensatory Concepts of Speed, Force, and Work, 373
Smith, John P.: The Development of a Classroom Observation Instrument Relevant to the Earth Science Curriculum Project, 231
Szabo, Michael and Feldhusen, John F.: Success in an Independent Study Science Course at the College Level as Related to Intellective, Personality, and Biographical Variables, 225
Tamir, P. and Glassman, F.: A Practical Examination for BSCS Students: A Progress Report, 307
Tannenbaum, Robert S.: The Development of the Test of Science Processes, 123
Thompson, Albert R.: *see* Anderson, Ronald D.
Tisher, Richard P.: Verbal Interaction in Science Classes, 1
Tolman, Richard: Student Performance in Lower Division Collegiate General Biology Programs in Selected Community Colleges and Four-Year Institutions in Oregon, 105
Van Koevering, Thomas E.: The Distinguishing Characteristics of High Schools with High and Low Enrollments in Physics, 37
Wasik, John L.: A Comparison of Cognitive Performance of PSSC and Non-PSSC Physics Students, 85
Young, Darrell D.: Team Learning: An Experiment in Instructional Method as Related to Achievement, 99
Young, Linda L.: *see* Benson, Bernard W.

JOURNAL OF RESEARCH IN SCIENCE TEACHING

Volume 8 1971

Editor

O. Roger Anderson

Teachers College, Columbia University
New York, New York

Associate Editor

J. W. GEORGE IVANY

Teachers College, Columbia University
New York, New York

Book Review Editor

MAURICE BELANGER

Universite du Quebec a Montreal
Montreal, Canada

Editorial Advisory Board

GLENN CRUMB
Kansas State Teachers College
Emporia, Kansas

MILTON O. PELLA
University of Wisconsin
Madison, Wisconsin

J. A. EASLEY, JR.
University of Illinois
Urbana, Illinois

RONALD J. RAVEN
State University of New York at Buffalo
Buffalo, New York

PAULINE GRATZ
Duke University Medical Center
Durham, North Carolina

JAMES T. ROBINSON
University of Colorado
Boulder, Colorado

J. DUDLEY HERRON
Purdue University
Lafayette, Indiana

MARY BUDD ROWE
Teachers College, Columbia University
New York, New York

JOSEPH F. JORDAN
John Wiley & Sons, Inc.
New York, New York

PETER B. SHORESMAN
University of Illinois
Urbana, Illinois

LEOPOLD E. KLOPFER
University of Pittsburgh
Pittsburgh, Pennsylvania

WAYNE W. WELCH
University of Minnesota
Minneapolis, Minnesota

EUGENE C. LEE
Emory University
Atlanta, Georgia

PAUL WESTMEYER
Florida State University
Tallahassee, Florida

ROBERT E. YAGER
University of Iowa
Iowa City, Iowa

Published under the auspices of

NATIONAL ASSOCIATION FOR RESEARCH IN SCIENCE TEACHING and ASSOCIATION FOR THE EDUCATION OF TEACHERS IN SCIENCE

by John Wiley & Sons, New York • London • Sydney

JOURNAL OF RESEARCH IN SCIENCE TEACHING

Volume 8, 1971

ISSUE 1, MARCH

Verbal Interaction in Science Classes: Richard P. Tisher..... 1

The Development of the Concept of Displacement Volume: A Hierarchical Model and Its Partial Testing Under Two Methods of Presentation: Darrell G. Phillips..... 9

An Analysis of Student Outcomes Utilizing Two Approaches to Teaching BSCS Biology: Harry F. Fulton..... 21

Hierarchical Analysis of the Randomized Multiple Choice Format: Douglas J. Harke..... 29

The Distinguishing Characteristics of High Schools with High and Low Enrollments in Physics: Thomas E. Van Koevering..... 37

Assessment of Affective Outcomes of Instruction with High School Sophomore Biology Students and Teachers: Lynn W. Glass..... 41

A Study of the Effects of Written and Film-Mediated Models on the Acquisition of Science Teaching Skill by Preservice Elementary Teachers: John J. Koran, Jr..... 45

The Influence of Set Induction upon Pupil Perception of Effective Teaching, Achievement, and Retention in Units on Respiration and Circulation in the BSCS Curricula: Robert F. Schuck..... 51

Development of Understanding about the Nature of Science: Lindsay D. Mackay 57

On the Ability to Infer Deficiency in Mathematics from Performance in Physics Using Hierarchies: David M. Riban..... 67

Development of Motion Picture Test Items Related to Elementary School Science Concepts: Rodney L. Doran and Milton O. Pella.. 83

A Comparison of Cognitive Performance of PSSC and Non-PSSC Physics Students: John L. Wasik..... 85

A Model for Knowledge of Concepts in Science: Paul E. Johnson, Thomas E. Curran, and David L. Cox..... 91

Book Review 96

ISSUE 2, JUNE

Editorial: Research in the "Open Classroom": O Roger Anderson.. 97

Team Learning: An Experiment in Instructional Method as Related to Achievement: Darrell D. Young..... 99

Student Performance in Lower Division Collegiate General Biology Programs in Selected Community Colleges and Four-Year Institutions in Oregon: Richard Tolman..... 105

Role Playing as a Technique for Developing a Scientific Attitude in Elementary Teacher Trainees: Earl F. Hughes..... 113

The Development of the Test of Science Processes: Robert S. Tannenbaum 123

An Assessment of Hierarchy Validation Techniques: William Capie and Howard L. Jones..... 137

Relative Effectiveness of Two Methods of Audio-Tutorial Instruction in Biology: Frederic E. Hoffman and Marvin Druger..... 149

A Study of the Relationship between the SCIS Teachers' Attitude Toward the Teacher-Student Relationship and Question Types: Larry R. Bruce..... 157

The Effect of Degrees of Direction in the Qualitative Analysis Laboratory on Retention of Learning: Charles M. Holcomb..... 165

A Study of Verbal Behavior Patterns in Primary Grade Classrooms During Science Activities: Thomas C. Moon..... 171

The Development of Group Achievement Tests for Two Basic Processes of AAAS Science—A Process Approach: Jean Beard..... 179

Evaluation of Student Laboratory Reports under a Schedule of Partial Reinforcement: Ronald D. Cohen..... 185

Relationships among Student Variables in an Audio-Tutorial Biology Course: David Sherrill and Marvin Druger..... 191

Book Reviews 195

Erratum 199

ISSUE 3, SEPTEMBER

An Empirical Investigation to Determine the Relative Effectiveness of Discovery, Laboratory, and Expository Methods of Teaching Science Concepts: Yeghia Babikian 201

The Development and Implementation of an Instrument to Assess Cognitive Performance in High School Biology: Bernard W. Benson and Linda L. Young 211

Success in an Independent Study Science Course at the College Level as Related to Intellective, Personality, and Biographical Variables: Michael Szabo and John F. Feldhusen 225

The Development of a Classroom Observation Instrument Relevant to the Earth Science Curriculum Project: John P. Smith 231

A Study of the Relationship between Certain Variables and the Science Interests of Children: Charles L. Koelsche and S. Lloyd Newberry 237

Research in Science Education: Planning for the Future: Paul deHart Hurd 243

The Role of Science Division Chairmen in Regionally Accredited Two-Year Colleges: A National Survey: Harmon B. Pierce 251

A Study of the Effects of a "Student-Structured" Laboratory Approach to Elementary Science Education Methods Courses: Affective Domain: Ronald G. Good 255

A Study of the Relationship between Self-Directed and Teacher-Directed Eighth Grade Students Involved in an Open-Ended Supplementary ESCP Laboratory Block: Arlyn A. Kline 263

Development of a Cognitive Preference Examination Utilizing General Science and Social Science Content: Ronald K. Atwood 273

How Do Children Classify Objects? Kenneth D. George and Maureen A. Dietz 277

Comment and Criticism

Research on Instruction: James R. Okey 285

Reappraising Science Education: Marjorie Gardner 289

Commentary on: "An Experimental Comparison of Urban Children with Suburban Children on Eight Tasks of Basic Skills," by Kenneth D. George and Maureen A. Dietz, *Journal of Research in Science Teaching*, 6, 224-233, 1969: John E. Penick 291

Authors' Reply: Kenneth D. George and Maureen A. Dietz 293

Book Reviews 295

ISSUE 4, DECEMBER

Mutually Aided Learning: An Evaluation: Ronald D. Anderson and Albert R. Thompson 297

A Practical Examination for BSCS Students: A Progress Report: P. Tamir and F. Glassman 307

Cognitive and Affective Process Development and Its Relation to a Teacher's Interaction Ratio: James Reed Campbell 317

The Effects of Cognitive Structure Variables on Achievement in College Chemistry: Donald G. Ring and Joseph D. Novak 333

Effects of Supervisory Methods upon Development of a Teaching Strategy by Student Teachers: Helen H. James 335

Structure in Perceived Relations among Physics Concepts: Heidi Kass 339

Attitude and Attitude Change: Its Influence upon Teaching Behavior: Helen H. James 351

Studies Involving the Application of Computer Techniques to Undergraduate Organic Chemistry Instruction: G. H. Culp and J. J. Lagowski 357

Attitude Change as a Result of Sex Education: Loren L. Hoch 363

Audio Tapes as an Instructional Device in College Mathematics: Robert D. McMillan and Eddie J. Brown 369

The Effects of Manipulation on the Acquisition of the Compensatory Concepts of Speed, Force, and Work: Betsy Davidson Siegel and Ronald Raven 373

Effects of Learner Characteristics on Pupil Performance in a Computer-Assisted Instruction (CAI) Biology Program: Stephen H. Davidoff, James J. Diamond, and Roger J. Fishman 379

The Effect of Behavioral Objectives on Student Achievement in College Chemistry: J. Dudley Herron 385

The Value of a Study of Wave Motion on the Learning of Certain Principles of Physical Optics: Floyd M. Read 393

Erratum 399

AUTHOR INDEX 401

VOLUME TITLE PAGE i

VOLUME CONTENTS iii